

Appl. No. 10/714,497
Amdt. Dated September 29, 2005
Reply to Office Action of June 30, 2005

Attorney Docket No. 81784.0293
Customer No.: 26021

REMARKS/ARGUMENTS

Claims 1-7 were pending in the Application. By this Amendment, claims 1 and 2 are being amended and claim 7 is being cancelled. No new matter is involved.

In Paragraph 5 which begins on page 2 of the Office Action, claims 1, 2 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art (APA) in view of U.S. Patent 6,354,909 of Boucher et al. In Paragraph 5 which begins on page 3 of the Office Action, claims 3, 4 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Boucher et al. and further in view of U.S. Patent 5,461,008 of Sutherland. In Paragraph 5 which begins on page 4 of the Office Action, claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Boucher et al. and Sutherland et al. and further in view of U.S. Patent 6,454,190 of Cook. These rejections are respectfully traversed, particularly in view of the amendments being made herein to claims 1 and 2.

A characteristic feature of the present invention is that, when a semiconductor substrate on which a carrier member is adhered with an insulating resin being interposed therebetween is to be cut, the cutting is performed while maintaining the insulating resin at a temperature lower than the softening temperature. Thus, as defined in Claim 1, the present invention is characterized in that the cutting is performed while cooling not only a dicing saw but also a cutting portion such that they are maintained at a temperature lower than a softening temperature of the insulating resin. As a result, for example, and as described in the specification of the application, it is possible to prevent adhesion of molten resin to the machined surface or the dicing saw. Therefore, metal wiring can be suitably

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deposited on the machined surface without forming any significant unevenness on the machined surface.

In contrast, Boucher et al. and Sutherland et al. describe processes of cooling a dicing saw, but the references do not include a description of cutting a laminated structure including an insulating resin while cooling a dicing saw to keep it at a temperature lower than a softening temperature of the insulating resin.

Cook only discloses a cooling system wherein cooling is performed simply by applying mist, and does not include a description concerning a cooling process performed at the time of cutting by a dicing saw.

Claim 1 defines a semiconductor device manufacturing method which includes a first step of forming a laminated structure by adhering, on a semiconductor substrate including a plurality of integrated circuits, a carrier member covering a region in which the plurality of integrated circuits are formed, with an insulating resin interposed between the semiconductor substrate and the carrier member. As amended herein, claim 1 includes a second step of "cutting the semiconductor substrate together with the insulating resin using a dicing saw while allowing at least a portion of the carrier member to remain uncut. As further amended herein, claim 1 includes a third step of "forming metal wiring on a machine surface created in the second step". Claim 1 further includes a fourth step of "dividing the laminated structure by cutting the carrier member". The second step is further characterized as being "performed while cooling the dicing saw and a cutting portion to be maintained at a temperature lower than the softening temperature of the insulating resin". As described above, the cited references, taken alone or in the attempted combination thereof do not show or suggest the method set forth in claim 1, particularly as it is amended herein.

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Claim 2 depends from and further defines claim 1 in terms of the second step being performed while the cooling is executed by spraying a coolant on the dicing saw "and the cutting portion". Claims 3-6 depend from and further define claim 2. Therefore, claims 2-6 are submitted to clearly distinguish patentably over the references in addition to claim 1.

Claim 7 is being cancelled.


In conclusion, claims 1-6 are submitted to clearly distinguish patentably over the prior art for the reasons set forth above. Therefore, reconsideration and allowance are respectfully requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6846 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
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